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## COLONIES AND TRADE.

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### VEGETABLE FIBRE.

*The Thanks of the Society were voted*

- I. *To W. BURGE, Esq., of Lincoln's Inn, for Samples of Vegetable Fibre, prepared in Jamaica, from two species, or varieties, of Pine-apple (Ananassa).*
- II. *To PETTY VAUGHAN, Esq., of Fenchurch Street, for Samples of Fibre, prepared in Jamaica, from the Bromelia Penguin.*
- III. *To W. HAMILTON, M.D., of Plymouth, for Samples of Fibre from Carthagera, known there by the name of Pita.*

ALL the plants belonging to the natural order of Bromeliaceæ are natives of the warmer parts of America. Their leaves originate from the crown of the root; are long, simple, gradually narrowing to a point at the extremity, very rigid, spinous at the edges, and contain more or less of straight fibre imbedded in green parenchymatous matter. This fibre is best separated by crushing the fresh leaf between rollers, or by mallets, and then beating it, while a stream of water flows over it, till every thing but the fibre

has been washed away. It may then be dressed like flax or hemp, may be applied to many of the same uses ; and the fibre from some of this class of plants has been said to exceed in tenacity that from either flax or hemp.

Whether the experiments that have been made to determine this latter point are sufficiently varied and accurate, may, perhaps, be doubted. It is certain, however, that the process of water-rotting, which is usually employed to loosen the adhesion of the fibres of flax and hemp to the wood and cuticle, cannot be performed without at the same time weakening the fibres ; but by this means their natural rigidity is overcome, and cordage made of such fibre is far more flexible than when made of that which has been prepared by simple washing. Still, if, by water rotting or by the use of caustic alkali, fibre somewhat inferior in strength to that of flax or hemp, but equal to it in flexibility, could be obtained from these American plants, and brought to market at a cost not greater than that of flax or hemp, the total supply of fibre would be increased ; and by multiplying at the same time the sources of supply, there would be less fluctuation in the price. Looking, also, to the present state of the West Indian colonies, it is evidently of considerable importance to introduce into them objects of culture, possibly better fitted than raising sugar to the new circumstances in which the labouring population of those islands now find themselves.

Of the true pine-apple (*Ananassa sativa*), several varieties are found in the West Indies ; and the specimens of fibre sent by Mr. Burge were prepared from two of these, namely, the sugar-pine and the Ripley, or black Antigua pine. The samples from the former consist of dried leaves, long fibres, and tow or combings ; and those

from the latter are combings, fibre, and a cord made of the fibre. The sugar-pine is very abundant in a wild state in Jamaica; the Ripley pine is less so.

The Penguin pine, from which the specimens presented by Mr. Vaughan were obtained, is considered by modern botanists as belonging to a different genus from the pine-apple: its systematic name is *Bromelia Penguin*. According to Professor Martyn (in his edition of Miller's Dictionary, article *Bromelia*), "it is very common in Jamaica, growing wild in most of the savannahs and on the rocky hills. It is commonly used there, and in the other islands of the West Indies, for fencing pasture lands, its leaves being very formidable to cattle, the edges being very prickly, and the prickles arched backwards. These, stripped of their pulp, soaked in water, and beaten with a wooden mallet, yield a strong thread, which is twisted into ropes and whips, and, by the Spaniards, is manufactured into hammocks; it has also been worked into good linen cloth." According to Mr. Vaughan, it has been made in Jamaica into common ropes; but the expense of labour in that island renders it more advantageous to import from England cordage ready made. The sample of this fibre sent by Mr. Vaughan, though prepared sixteen or seventeen years ago, is stronger than either of those sent by Mr. Burge.

Fibre is also obtained from the wild pine-apple at Singapore, as appears from the following extract from Bennett's Wanderings in New South Wales, &c. Vol. II. p. 207. "Early one morning I visited a plantation of a Chinese (in company with Mr. Lorrain and the Rev. Mr. Darrah) situated in the vicinity of the settlement, for the purpose of witnessing the preparation of the fibres from the leaves of the Ananas, or wild pine-apple; which fibres,

after being prepared by a very simple process, are exported to China, and used in the manufacture of linen, &c. The Chinese, who prepared the leaves before us, said he got one rupee and a half the catty for the fibre: it was in texture, when manufactured, very similar to the New Zealand flax of a fine quality, and there is also some similarity in the manner in which it is wrought. The leaves recently gathered (and the longest and oldest are those which appear to be selected for the purpose) are laid upon a board, and the epidermis is removed by a broad knife, not unlike in form to a shoemaker's paring knife: upon its removal from the upper surface of the leaf, the long and beautiful fibres were seen lying upon the lower and denser epidermis, running in a longitudinal direction; the fasciculi of fibres were then readily detached, either by hand, or by being raised with the broad knife. Some quantity of this material is annually exported to China; and at Manilla, a very delicate and beautiful fabric is made from the fibres of this plant."

The sample of Pita, for which the Society are indebted to Dr. Hamilton, consists of a few yards of log-line made of it in the dock-yard at Plymouth. The fibre of which this is composed is so hard and harsh, probably from imperfect manipulation, that it can scarcely be considered as in a fair state for experiment. On a mean of three trials made in the royal dock-yard at Plymouth, the length of the cord being each time three yards, it broke with a weight of 160 pounds; while a mean of three similar trials with a cord of Riga hemp gave a tenacity of 190 pounds. But it appears, from Dr. Hamilton's letter, that of two bundles of log-line of equal length, that made of hemp weighed 2 lbs. 1 oz., whereas that made of pita weighed only 1 lb. 14 oz. Hence it may be inferred, that

the former contained  $\frac{1}{1}$  more fibre than the latter; and that, therefore; the fair proportion of their tenacity, if equal weights of the two had been made into equal lengths of cord, would have been 174 to 192, being a difference in favour of the hemp of  $\frac{1}{17}$ , and this small superiority might perhaps have been reduced to nothing if the fibre of the pita had been made equally flexible as that of the hemp. It appears from Dr. Hamilton's letters, addressed to the Secretary of the Society, that Mr. Watts, his majesty's consul at Carthagena, in Columbia, forwarded, in March 1825, some seeds of the pita to Dr. Hamilton. Plants were raised from this seed at Plymouth in 1827; they have not yet, however, flowered, and therefore the botanical characters of the genus are as yet only known from a dried specimen of the fruit. From this Dr. Hamilton has determined, that it consists of an aggregate of dry capsules arranged round a central axis, which is a continuation of the scape, so that it bears some resemblance to a small pine-apple without a crown. Each capsule has a triangular bractea, armed at the edges with spinous recurved teeth, and terminating in a strong spine. The capsules are triangular, one-celled, and many-seeded. The seeds, most of which are abortive, are irregularly reniform, and blunt at the ends. From the latter character, it appears that the pita is not a *Pourretia*, *Pitcairnia*, *Acanthospora*, *Tillandsia*, or *Gusmannia*; and, from its having a dry and not succulent fruit, it is not a *Bromelia*, *Ananassa*, *Bilbergia*, or *Æchmæa*; while it differs from all the above-mentioned genera in having not a three-celled, but an one-celled capsule.

The term Pita is applied in the Spanish colonies to various vegetable fibres obtained from native plants, especially from the genera *Agave*, *Yucca*, and *Bromelia*;

but the best pita, according to Mr. Watts, is produced from a plant abundant near the village of Guataca, in the province of Carthagena, and called Pita de Guataca. It is used for fishing-nets, cordage, and shoes of spun-yarn, and, from the statement of Captain M'Adam, R.M., is served out to the surgeons of his majesty's ships in the West Indies for ligatures, in preference to hemp,

In Carthagena, the plant is propagated by slipping off the lateral suckers. The leaves, when full grown, are three or four yards long, and three or four inches thick. In this state they are cut, and are either pounded or crushed between rollers; are then well washed, in order to separate all extraneous matter from the fibres; and these latter, being afterwards combed and bleached, are ready for use.

In January 1830, Mr. Watts, at the request of Dr. Hamilton, sent to Dr. Bancroft of Jamaica some suckers of the pita, for cultivation in that island. Concerning the present state of these plants, the Society possess no information; but with respect to the fitness of the fibre of the pita to be applied to naval uses, Dr. Bancroft has supplied an example in his address last year, as president of the Society in Jamaica for the encouragement of agriculture and other arts, in which the following statement occurs: "—As I lately witnessed in this harbour (Kingston), on board a fine schooner from Tampico, where the cables and standing rigging were made entirely from pita."

In the year 1826, the Rev. James Thomson presented to the Society various articles collected by him in South America, a catalogue of which is inserted in the 44th Vol. of our Transactions, page 190. One of these is called *Cabulla nigra*, or black Cabulla, and is the fibre of the Maguey of Mexico, *Agave Americana* of botanists: another

is called Cabulla blanca, or white Cabulla, which Mr. Thomson describes as growing only in the hottest climates, and producing fibres nine feet long. The specimens of the article are: 1. twine or thread, called pita; 2. two ropes; 3. a purse; 4. a man's shoe and a child's. It is evident that this is the same substance as Dr. Hamilton's pita; and Mr. Thomson recommends that comparative trials of the tenacity of this fibre with hemp should be made, in order to ascertain if "an article so important to our navy and to our commerce might not in future be got from South America, instead of from the north of Europe.

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#### No. IV.

#### INSECT INJURIOUS TO THE SUGAR-CANE.

*The Thanks of the Society were voted to C. J. JOHNSTONE, Esq. late of the Island of Grenada, and now residing in Great Ormond Street, for his Account of an Insect that destroys the Sugar-cane in the Island of Grenada.*

IN the 46th Volume of the Society's Transactions is a paper by the late Rev. Lansdowne Guilding on a large coleopterous insect, the *Calandra palmarum*, and on two or three other insects which in their grub state do more or less damage to the sugar-cane in the islands of the West Indies.